

CLAIMS

We claim:

- Sub. 1
1. An electronic drive unit assembly for a heavy-duty vehicle comprising:  
a non-rotating spindle having an interior chamber;  
a wheel hub supported on at least one bearing for rotation relative to said spindle about an axis of rotation; and  
an electric motor mounted within said interior chamber and having an output shaft operatively coupled to drive said wheel hub about said axis of rotation.
2. An assembly according to claim 1 including a reduction gear assembly mounted within said wheel hub, said reduction gear assembly having an input operatively coupled to said output shaft and an output operatively coupled to said wheel hub.
3. An assembly according to claim 2 wherein said reduction gear assembly includes a plurality of inner gears operatively coupled to said input and a plurality of outer gears coupled to said output with each one of said inner gears having a corresponding outer gear to form a gear pair and wherein each gear in said gear pair is supported on a common shaft such that said inner and outer gears rotate at a common speed.
4. An assembly according to claim 3 wherein said inner gears have a first predetermined number of gear teeth and said outer gears have a second predetermined number of gear teeth that is different than said first predetermined number of gear teeth.

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5. An assembly according to claim 4 wherein said input comprises a sun gear mounted for rotation with said output shaft and said output comprises an outer ring gear mounted to said wheel hub and wherein said inner gears are in meshing engagement with said sun gear and said outer gears are in meshing engagement with said outer ring gear.
6. An assembly according to claim 5 wherein said shafts from each of said gear pairs are mounted to a common spider that rotates about said axis of rotation.
7. An assembly according to claim 6 wherein said spider is rotatably supported on a bearing surface such that said sun gear and said spider can rotate at different speeds relative to each other.
8. An assembly according to claim 7 including an inner ring gear mounted to said spindle wherein said inner gears are in meshing engagement with said inner ring gear.
9. An assembly according to claim 8 wherein said inner ring gear, said sun gear, said spider, and said outer ring gear are concentric.
10. An assembly according to claim 4 wherein said input comprises a spider in driving engagement with said output shaft and said output comprises an outer ring gear mounted to said wheel hub and wherein said spider supports said shafts from each of said gear pairs to rigidly connect said inner gears to said outer gears such that each gear pair rotates with said spider about said axis of rotation.

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11. An assembly according to claim 10 including an inner ring gear mounted to said spindle wherein said inner gears are in meshing engagement with said inner ring gear and said outer gears are in meshing engagement with said outer ring gear.

12. An assembly according to claim 11 wherein said inner ring gear, said spider, and said outer ring gear are concentric.

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13. An electronic drive unit assembly for a heavy-duty vehicle comprising:  
a non-rotating spindle mounted to a vehicle structural component, said spindle defining an interior spindle chamber;  
a wheel hub supported on at least one bearing for rotation relative to said spindle about an axis of rotation, said wheel hub defining an interior hub chamber;  
a reduction gear assembly mounted within said hub chamber, said reduction gear assembly having an input and an output operatively coupled to said wheel hub; and  
an electric motor mounted within said interior spindle chamber and having a motor output shaft operatively coupled to said input to drive said wheel hub about said axis of rotation.
14. An assembly according to claim 13 wherein said reduction gear assembly includes an inner ring gear mounted to said spindle and operatively coupled to said input and an outer ring gear mounted to said wheel hub and operatively coupled to said output.
15. An assembly according to claim 14 wherein said reduction gear assembly includes a plurality of inner gears in meshing engagement with said inner ring gear and a plurality of outer gears in meshing engagement with said outer ring gear with each one of said inner gears having a corresponding outer gear to form a plurality of gear pairs and wherein each gear in said gear pair is rigidly mounted to a common shaft.
16. An assembly according to claim 15 wherein said inner gears have a first predetermined number of gear teeth and said outer gears have a second predetermined number of gear teeth that is different than said first predetermined number of gear teeth.

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17. An assembly according to claim 16 wherein said input comprises a sun gear mounted for rotation with said output shaft and in meshing engagement with said inner gears.
18. An assembly according to claim 17 including a spider that supports said shafts from each of said gear pairs to rigidly connect said inner gears to said outer gears such that each gear pair rotates with said spider about said axis of rotation.
19. An assembly according to claim 18 wherein said spider is rotatably supported on a bearing surface such that said sun gear and said spider can rotate at different speeds relative to each other.
20. An assembly according to claim 16 wherein said input comprises a spider in direct driving engagement with said output shaft, said spider supporting said shafts from each of said gear pairs to rigidly connect said inner gears to said outer gears such that each gear pair rotates with said spider about said axis of rotation.

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